Chapter 5 Review

5.1 Multiply Polynomials, pages 210–219

1. Use the distributive property to find each binomial product.

a) $(x + 5)(x + 8)$ **b)** $(x - 1)(x - 4)$

c) $(x + 3y)(x - 6y)$ **d)** $(5a - 6b)(2a + 9b)$

2. Expand and simplify.

a) $-(k + 2)(k - 7)$

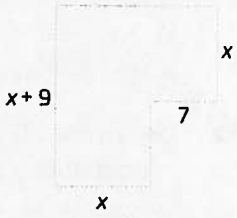
b) $w(w - 7v)(w - 3v)$

c) $7x(7x + 3y)(3x + 9y)$

d) $(y + 1)(y + 8) + (y - 8)(y + 1)$

e) $-4(2x - 6)(4x - 5) + 3(11x + 7)(11x - 4)$

3. Write an algebraic expression to represent the area of the figure. Expand and simplify.



5.2 Special Products, pages 220–227

4. Draw a diagram to illustrate each product.

a) $(x + 4)^2$ **b)** $(a + 2)^2$

5. Expand and simplify.

a) $(x + 6)^2$ **b)** $(k + 8)^2$ **c)** $(p + 7)^2$

d) $(r - 2)^2$ **e)** $(e - 9)^2$ **f)** $(q - 20)^2$

6. Expand and simplify.

a) $(b + 6)(b - 6)$ **b)** $(a - 7)(a + 7)$

c) $(y + 12)(y - 12)$ **d)** $(x - 15)(x + 15)$

e) $(e - 10)(e + 10)$ **f)** $(x + 6)(x - 6)$

7. Expand and simplify.

a) $(y + 4x)^2$

b) $(7m - n)^2$

c) $(2c + 9d)^2$

d) $-2(5x + 7y)(5x - 7y)$

e) $(3a - 8c)(3a + 8c)$

f) $-(5x - 8y)(5x + 8y)$

5.3 Common Factors, pages 228–235

8. Use algebra tiles or a diagram to illustrate the factoring of each polynomial.

a) $x^2 + 9x$ **b)** $3x^2 + x$

9. Factor.

a) $12y + 24z$ **b)** $11xy - 9xz$

c) $c^2 + 3c$ **d)** $4k - 8k^3$

10. Factor by grouping.

a) $4m^2 + 12m + 3m + 9$

b) $9k^2 - 6k + 6k - 4$

c) $8x^2 + 16x - 5x - 10$

d) $16x^2 - 12xy - 12xy + 9y^2$

11. Factor, if possible.

a) $8m^2 - 16m + 4$

b) $18c^3 + 24c^2 - 8c + 6$

c) $15m^2 - 22mn + 66mn^2$

d) $ax^2z - az^2 + axz$

12. A rectangle has area given by the expression $10x^2 + 5x$. The length and width can be found by factoring the expression. Find all possible expressions for the length and width.

5.4 Factor Quadratic Expressions of the Form $x^2 + bx + c$, pages 236–241

13. Illustrate the factoring of each trinomial using algebra tiles or a diagram.

a) $x^2 + 9x + 14$

b) $x^2 + 11x + 18$

c) $x^2 + 4x + 4$

14. Factor.

a) $c^2 - 17c + 72$ **b)** $x^2 - 8x + 15$

c) $z^2 - 14z + 33$ **d)** $x^2 + 3x - 10$

e) $x^2 + 8x - 9$ **f)** $x^2 - 2x - 8$

15. A parabola has equation $y = x^2 - 3x - 18$.

a) Factor the right side of the equation.

b) Identify the x-intercepts of the parabola.

c) Find the equation of the axis of symmetry, find the vertex, and draw the graph.

5.5 Factor Quadratic Expressions of the Form $ax^2 + bx + c$, pages 242–249

16. Factor. Use a diagram, if needed.

a) $2x^2 + 7x + 6$ **b)** $6y^2 + 29y + 9$

c) $6a^2 - 23a + 15$ **d)** $4b^2 - 5b + 1$

e) $12m^2 + 20m - 8$ **f)** $14k^2 - 31k - 10$

17. Factor, if possible.

a) $8x^2 + 2xy - 15y^2$ **b)** $5c^2 - 4cd + 9d^2$

c) $12m^2 + 13mn + 3n^2$ **d)** $2w^2 - 9wx - 8x^2$

e) $24x^2 + 6xy - 9y^2$ **f)** $9g^2 + 4g - 10$

18. A rectangle has area defined by $8x^2 + 2x - 15$.

Area is $8x^2 + 2x - 15$.

a) Factor to find algebraic expressions for the length and width of the rectangle.

b) If x represents 12 cm, determine the perimeter and the area of the rectangle.

5.6 Factor a Perfect Square Trinomial and a Difference of Squares, pages 248–255

19. Factor.

a) $x^2 - 49$ **b)** $y^2 - 121$

c) $4k^2 - 9$ **d)** $16 - 144a^2$

e) $9w^2 - 25x^2$ **f)** $1 - 81p^2$

20. Verify that each trinomial is a perfect square. Then, factor.

a) $x^2 + 14x + 49$

b) $k^2 + 8k + 16$

c) $y^2 - 10y + 25$

d) $25y^2 - 70y + 49$

e) $36c^2 - 108c + 81$

f) $121 + 176y + 64y^2$

21. Determine all values of k so that each trinomial is a perfect square.

a) $25y^2 + ky + 144$

b) $9x^2 - 42x + k$

22. Factor, if possible.

a) $9w^2x^2 - 24wxyz + 16y^2z^2$

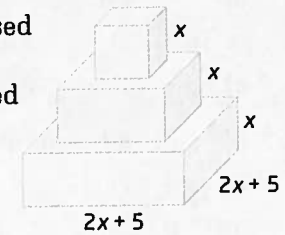
b) $625 - (y - 5)^2$

c) $144a^4 - 499b^4$

d) $25x^2 + 30x + 4$

Chapter Problem Wrap-Up

In Section 5.2, question 13, you wrote algebraic expressions for the exposed top surface areas of the middle and bottom layers of the pedestal. In Section 5.6, question 13, you factored algebraic expressions for the exposed top surface areas of the middle and bottom layers of the pedestal.



a) Consider your resulting expressions from Section 5.2. Factor these expressions.

b) Were the results the same as those from Section 5.6? Explain.

c) Calculate the total volume of wood that will be used in building the pedestal, if x represents 5 cm and if x represents 10 cm. Compare the results.

d) When you doubled the value of x in part c), did the volumes double? Why or why not?